

Tutorial Ch 3

Indicate the answer choice that best completes the statement or answers the question.

1. The California Health Interview Survey (CHIS) is the nation's largest statewide telephone health survey. The CHIS has been conducted biennially since 2001, using a two-stage process that is designed to generate a sample that represents the state. At the first stage, telephone numbers are drawn within predefined geographic areas. Telephone numbers are screened to determine whether they represent households and are thus eligible for the survey. At the second stage, one adult is randomly selected among all adults living in a household. What type of sampling method is being used?

- a. Simple random sampling
- ☒ b. Multistage random samples
- c. Stratified random samples
- d. None of the above



2. If you test the effects of different amounts of time (1 hour, 2 hours, and 6 hours) spent watching television per day on the ability to focus better, you are testing time watching television at three different _____.

- a. treatments
- b. levels
- c. factors
- d. None of the above

3. What is the best way to control for lurking variables?

- a. Compare two or more treatments.
- b. Randomize to assign experimental units to treatments.
- c. Repeat each treatment on many units.
- d. None of the above

4. Which of the following statements best describes the difference between an observational study and an experiment?

- a. In an experiment, the researcher is careful to determine exactly what is to be observed, whereas in an observational study, there is greater concern about how the observations are made.
- b. In an experiment, the data are obtained using careful controls on the treatments, but in an observational study, the data are obtained through careful observation of the responses.
- c. In an experiment, treatments are deliberately applied to individuals, and their responses are observed. In an observational study, individuals are observed, and variables of interest are measured, without any attempt to influence the responses.
- d. There are really no significant differences between observational studies and experiments. They are different names for essentially the same type of study.
- e. Without concrete examples, it is not possible to detect what the differences might be.

5. Do people prefer tap water or bottled water? For this study, the two different water samples are poured into two cups that look the same but are marked on the bottom. Each subject then tastes both water samples and rates the taste of each on a five-point scale (1 = poor to 5 = excellent). What type of design is this?

- a. Experiment

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- b. Observational study
- c. Matched pairs design
- d. Completely randomized design

6. A common fear for incoming freshman in college is the dreaded “freshman fifteen.” The combination of being in a new environment away from home, a high stress level, alcohol consumption, and eating dining hall food can cause weight gain in college students. A study examined weight gained during the first year of college and what factors contribute to it. A 27-question survey was sent to 252 students at over 50 universities in the United States. Questions included information on demographics, weight gain, diet, family relationships, etc. Ninety-five survey responses were received from students across 37 United States colleges and universities, with 32 respondents from Rose-Hulman Institute of Technology. Do you notice any potential issues with the study?

- a. The study is probably biased because almost one-third of the respondents are from one university.
- b. The sample size is too small.
- c. The response rate is too low for a valid study.
- d. There are no potential issues with the study.

7. David A. Miller owns a small advertising business. He has nine employees. The names of the employees are given below.

1. Becker	4. Ito	7. Taylor
2. Brown	5. Kiefer	8. Walt
3. Chasten	6. Spitzer	9. Weiss

Use the following list of random digits to select a simple random sample of three names from the list of employees. Start at the beginning of the list, and use the numerical labels attached to the names.

11793 20495 05907 11384 44982 20751 27498 12009 45287 71753

The simple random sample consists of

- a. 117.
- b. Becker, then Becker again, and then Taylor.
- c. Becker, Taylor, and Weiss.
- d. Chasten, Kiefer, and Taylor.

8. Which of the following would lead to response bias?

- a. Conducting a Coke-versus-Pepsi taste test on a campus that serves only Pepsi products
- b. Poorly worded questions
- c. Simple random samples
- d. Both A and B

9. A study to determine whether or not a football filled with helium traveled farther when kicked than one filled with air found that the football filled with helium went, on average, farther than the one filled with air. However, the difference was not statistically significant. What is the response variable in this study?

- a. The air or helium with which the football was filled
- b. The number of kickers
- c. The distance that the football traveled

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- d. There is no response variable, because the difference was not statistically significant.
10. The organization that reviews all planned studies is called:
- a. the Institutional Review Board.
 - b. the Informed Consent Panel.
 - c. the Confidentiality Committee.
 - d. None of the above
11. A group of college students believes that herbal tea has remarkable restorative powers. To test its theory, the group makes weekly visits to a local nursing home, visiting with residents, talking with them, and serving them herbal tea. After several months, many of the residents are more cheerful and healthy. What is the explanatory variable in this experiment?
- a. The emotional state of the residents
 - b. Herbal tea
 - c. The fact that this is a local nursing home
 - d. The college students
12. Following the analysis of a well-designed, completely randomized experiment, it was reported that the observed effect was statistically significant. Which of the following statements best explains the meaning of the phrase “statistically significant”?
- a. The observed result made sense to the experimenters because it was what they hoped would happen.
 - b. The observed effect happened because the experiment was properly designed and carried out without bias.
 - c. The experimenter carefully employed the basic principles of experimental design in conducting the study.
 - d. The laws of probability say that this observed result would be expected to happen by chance.
 - e. The observed effect was sufficiently large that it would rarely occur simply by chance.
13. An opinion poll is to be given to a sample of 90 members of a local gym. The members are first divided into men and women, and then a simple random sample of 45 men and a separate simple random sample of 45 women are taken. What is this an example of?
- a. A block design
 - b. A stratified random sample
 - c. A double-blind simple random sample
 - d. A randomized comparative experiment
14. A market research firm has been asked to survey the population of people in a particular city who are 16 years of age or over with respect to their preferences for television programming. To do this the firm divides the list of the target population into five age groups: 16 to 25, 26 to 35, 36 to 45, 46 to 55, and 56 or older. From each of these age groups a simple random sample of 225 people is selected, for a total sample of size 1125 individuals. Assume that all of these selected individuals respond honestly to the survey questions. The resulting sample is an example of what kind of sample design?
- a. Multistage sample design

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- b. Volunteer sample design
- c. Stratified random sample design
- d. Simple random sample design
- e. Systematic random sample design

15. In order to assess the opinion of students at a large university about campus snow removal, a reporter for the student newspaper interviews the first 12 students she meets who are willing to express their opinions. What set of students make up the sample?

- a. All those students favoring prompt snow removal
- b. All students at universities receiving substantial snow
- c. The 12 students interviewed
- d. All students at the University of Minnesota

16. The California Health Interview Survey (CHIS) is the nation's largest statewide telephone health survey. The CHIS has been conducted biennially since 2001, using a two-stage process that is designed to generate a sample that represents the state. At the first stage, telephone numbers are drawn within predefined geographic areas. Telephone numbers are screened to determine whether they represent households and are thus eligible for the survey. At the second stage, one adult is randomly selected among all adults living in a household. What is one limitation of CHIS?

- a. Under-coverage—people without phones are not included in survey.
- b. Under-coverage—not every geographic area is sampled.
- c. Possible bias as a result of under-coverage.
- d. Both A and C
- e. Both A and B

17. A market research company wishes to find out which of two Internet search engines the population of students at a university prefers to use: Google or Yahoo. A random sample of students is selected, and each one is asked to search for a certain subject using Google and then Yahoo, or vice versa. The order of the two searches was determined at random. They then indicated which Internet search engine they preferred. What type of study is this?

- a. An observational study that is not a sample survey
- b. An observational study that is a sample survey
- c. An experiment but not a double-blind experiment
- d. A double-blind experiment
- e. None of the above

18. A call-in poll conducted by *USA Today* concluded that Americans love Donald Trump. This conclusion was based on data collected from 7800 calls made by *USA Today* readers. What sampling technique is being used?

- a. Simple random sampling
- b. Stratified random sampling
- c. Volunteer sampling
- d. Convenience sampling

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19. In a recent study, a random sample of children in grades 2 through 4 showed a significant *negative* relationship between the amount of homework assigned and student receptiveness to homework. What type of variable is the amount of homework assigned?

- a. An explanatory variable
- b. A response variable
- c. A confounding variable
- d. A lurking variable

20. A marketing research firm wishes to determine whether the adult men in Laramie, Wyoming, would be interested in a new, upscale men's clothing store. From a list of all residential addresses in Laramie, the firm selects a simple random sample of 100 and mails a brief questionnaire to each. What is the sample in this survey?

- a. All adult men in Laramie, Wyoming
- b. All residential addresses in Laramie, Wyoming
- c. The members of the marketing firm that actually conducted the survey
- d. The 100 addresses to which the survey was mailed

Name: _____ Class: _____ Date: _____

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Answer Key

1. b
2. b
3. b
4. c
5. c
6. a
7. c
8. d
9. c
10. a
11. b
12. e
13. b
14. c
15. c
16. a
17. c
18. c
19. a
20. d